

Remarks

Claims 1-42 are pending in this application. The objections and rejections of the Office Action will be addressed in the numerical order as designated by the numbered paragraphs of the Office Action.

1. Drawing Objections

The drawings are objected to under 37 C.F.R. 1.84(p)(5) as including a reference numeral 290 in Figure 4 which is not mentioned in the Description. An amended Drawing Sheet 3 presenting Figure 4 has been submitted herewith deleting the reference numeral 290. This is believed to resolve the drawing objection in this numbered paragraph of the Office Action.

3. Claim Rejections Under 35 U.S.C. Section 112

Claims 15 and 34 stand rejected under 35 U.S.C. Section 112 on the basis that the filter limitation is not sufficiently described in the Specification. Applicant has cancelled claims 15 and 34 to resolve the rejection of these claims under 35 U.S.C. Section 112.

5. Rejections Under 35 U.S.C. Section 112

Claims 40 and 42 stand rejected under 35 U.S.C. Section 112, second paragraph, as indefinite for various limitations for averaging the instantaneous power factor over line cycle to determine power factor. The limitation is stated by the Examiner to be vague and indefinite because claim 39 already defines power factor as an instantaneous power factor. Applicant respectfully traverses these rejections. "Instantaneous" is defined in the Specification (page 6, lines 18-20) as "representative of the load the power is being sourced to at a specific point in time" (emphasis added). The calculation of instantaneous power factor is provided in the Specification, page 12, line 15 through page 13, line 20. Claims 39 and 41 respectively reference determining an instantaneous power factor and means for determining an instantaneous power factor. Given the definition of instantaneous in the Specification, it is clear that these independent claims determine an instantaneous power factor at a specific point in

time. Their respective dependent claims 40 and 42 further claim a requirement to average the instantaneous power factor over a line cycle to determine a power factor. Applicant has amended claims 40 and 42 to provide antecedent basis to the phrase "power factor" and to thereby clarify that this power factor is not identical to the instantaneous power factor referenced in the claim from which the dependent claims depend. It is submitted that a person of ordinary skill in the art will clearly understand averaging an instantaneous power factor over a line cycle to determine a power factor. The Examiner is requested to reconsider and withdraw this rejection.

7. Rejection of Claims 1, 2, 20 and 21 Under 35 U.S.C. Section 102(b)  
In View of U.S. Patent 5,673,196 to Hoffman et al.

Claims 1, 2, 20 and 21 stand rejected under 35 U.S.C. Section 102(b) in view of U.S. Patent 5,673,196 to Hoffman et al. Applicant respectfully traverses this rejection.

Each of claims 1 and 20, and consequently the dependent claims 2 and 21 respectively, claim an instantaneous three-phase power factor. This required claim element is not present in Hoffman et al. Hoffman et al.'s determinations are all made over an interval and thus cannot comprise an instantaneous power factor. Without identifying all of the instances in Hoffman et al. relative to intervals, the Examiner's attention is called to the following selections from Hoffman et al.:

- a. "Over determined interval of orthogonality" (column 3, line 54);
- b. "An interval of orthogonality" (column 4, line 14);
- c. "A series of digital phase current samples, each sample corresponding to the sampling time for the corresponding digital line voltage sample or line current sample" (column 4, lines 31-34);
- d. "The interval of orthogonality is preferably determined by detecting the passage of a predetermined integral number of cycles of a fundamental frequency reference signal which approximates the frequency of fundamental component of the voltages and currents on the power cycle" (column 4, lines 34-39);
- e. "For the interval of orthogonality" (column 4, lines 51-52);
- f. "During the interval" (column 4, lines 60-67);

- g. "For the interval of orthogonality by the number of sampling times occurring within the interval (column 5, lines 17-19);
- h. "Over a series of consecutive periods of a fundamental frequency signal to obtain a set of migratory dessimated samples" (column 5, lines 37-39);
- i. "The interval ( $T_1, T_2$ ) as an interval of orthogonality" (column 9, line 21);
- j. "an interval of orthogonality for all the sinusoidal voltages and currents as an integral number of cycles of the fundamental frequency component" (column 9, lines 39-42).

Based on this sample of specific language from Hoffman et al., it is submitted that Hoffman et al. does not disclose the calculation of an instantaneous power factor and that claims 1 and 20 and their dependent claims are novel and patentable in view of Hoffman et al. The Examiner is requested to reconsider and withdraw the rejection of these claims under 35 U.S.C. Section 102(b).

9. Rejection of Claim 3-12, 22-31, 39 and 41 Under 35 U.S.C. Section 103(a) in View of Hoffman et al.

Claims 3-12, 22-31, 39 and 41 stand rejected under 35 U.S.C. Section 103(a) in view of U.S. Patent 5,673,196 to Hoffman et al. Applicant respectfully traverses the rejection of these claims under Hoffman et al.

As noted above, Hoffman et al. does not disclose the calculation of an instantaneous power factor. Moreover, Hoffman et al. makes no suggestion of any modification or alteration which might result in any of the claims herein relative to instantaneous power factors. Consequently, all the claims are submitted to be novel and patentable in view of Hoffman et al.

The specific details of how the instantaneous power factor is implemented relative to the present invention are further submitted to be independently novel and patentable relative to each of the dependent claims and these dependent claims are submitted to be independently novel and patentable in view of Hoffman et al.

Applicant also submits that no combination of Hoffman et al. with any of the references cited in the Office Action will result in the claimed invention relative to instantaneous power factor and that claims 3-12, 22-31, 39 and 41 are novel and patentable in view of Hoffman et al.

10. Rejection of Claims 13, 14, 16-19, 32, 33 and 35-38 Under 35 U.S.C. Section 103(a) in View of the Proposed Combination of Hoffman et al. and U.S. Patent 5,434,738 to Kurszewski et al.

Claims 13, 14, 16-19, 32, 33 and 35-38 stand rejected under 35 U.S.C. Section 103(a) in view of the proposed combination of Hoffman et al. and Kurszewski et al. Applicant respectfully traverses these rejections.

All the foregoing comments relative to Hoffman et al. are relevant but are not repeated for the sake of brevity. Additionally, the addition of Kurszewski et al. adds nothing to the calculation of instantaneous power factor inasmuch as Kurszewski et al. is directed to protecting induction motors from momentary power loss. Applicant is fully aware of Kurszewski et al. inasmuch as two of the inventors Matthew A. Shepeck and Michael W. Murry are in common for both the Kurszewski et al. patent and the present application.

Kurszewski et al. is submitted to be not particularly relevant to the calculation of instantaneous power factor and the combination of Hoffman et al. and Kurszewski et al. fails to disclose the claimed invention relative to instantaneous power factor. In view of the lack of a reason in either Hoffman et al. or Kurszewski et al. to either be combined together or be modified after such a combination to result in the claimed invention, applicant submits that the claims on file are novel and patentable in view of Kurszewski et al. or Hoffman et al. whether taken individually or in combination. Reconsideration and withdrawal of the rejections based on such a proposed combination is requested.

11. Rejection of Claims 15, 34, 40 and 42 Under 35 U.S.C. Section 103(a) in View of the Proposed Combination of Hoffman et al., Kurszewski et al. and the Grady et al. Article "Harmonics and how They Relate to Power Factor"

Claims 15, 34, 40 and 42 stand rejected under 35 U.S.C. Section 103(a) in view of proposed combination of Hoffman et al., Kurszewski et al., and Grady et al. Applicant respectfully traverses these rejections for all of the reasons set forth above.

It is submitted that the Grady et al. document fails to remedy the deficiencies of the other cited arts relative to instantaneous power factor and that any combination of Hoffman et al., Grady et al. and Kurszewski et al., whether individually or in combination, fails to disclose the claimed invention. The Examiner is requested to reconsider and withdraw the rejections.

Summary

With the foregoing remarks and amendments and submissions, each issue raised by the Office Action is believed to have been fully addressed. Should applicant have failed to fully address an issue, the Examiner is requested to contact applicant's representative for a telephone discussion. Elsewise, early and expeditious allowance of the application is requested.

Respectfully Submitted,



William O'Driscoll  
Registration No. 33,294

Telephone Number: (608) 787-2538